REMARKS

Claims 1-10 have been examined and are pending in the present application. New claims 11-15 have been added to further describe the patentable features of the present invention.

I. Rejection under 35 U.S.C. § 102

Claims 1-10 stand rejected under 35 U.S.C. 102(b) as being anticipated by Kano (US 2002/0172150). Applicants traverse this rejection.

A. Claim 1

The present invention relates to establishing a restoration path in a transport network (e.g., SDH, SONET or OTN) by redirecting traffic of a failed physical link or logical path over a spare resource (see pg. 1-2 of Applicants' specification). In particular, claim 1 recites:

> A method of establishing a path through a transport network, said network comprising a number of physically interconnected network elements (NEn-1, NEn, NEn-1); transmission signals being transported over physical connections between said network elements; each transmission signal being subdivided into frames of the same length, said frames being structured according to a multiplex hierarchy into multiplex units respectively representing paths through said network and repeating every frame thereby forming traffic streams multiplexed to form said transmission signals; said method comprising the steps of
> - assigning each traffic stream an identifier called hereinafter a path tag which is sent in said traffic stream on a regular basis;
> - providing forwarding information (FT) in each network element along said path to be established;
> - receiving (a1) a new traffic stream at an input port (I1) of a network element (NEn);
> - checking (a2) the path tag of the received traffic stream and determining (a3) an appropriate output port (O2) based on said path tag and the forwarding information (FT); and
> - establishing (a4) an internal cross-connection between said input port (I1) and said previously determined output port (O2).

The Examiner asserts:

> Kano discloses a method of establishing a path through a transportation network comprising network elements, wherein transmission signals are transported

> over physical connections and each transmission signal is divided into frames for a multiplex hierarchy (paragraph 33; note: SONET/SDH). The method comprises the steps of assigning a traffic stream a tag (fig. 1), providing forwarding information (item 11; fig. 2), and routing the data stream according to the label (fig. 3; para. 44; note: selected output ports). Further regarding claims 6 and 9, the method is performed by a network element or management facility (fig. 1) that comprises ports (para. 44), a low-level controller (item 10) and memory (item 11), a monitor (item 14), and a cross connect matrix (item 12).

Kano fails to disclose assigning each traffic stream an identifier called hereinafter a path tag which is sent in said traffic stream on a regular basis and checking (a2) the path tag of the received traffic stream and determining (a3) an appropriate output port (O2) based on said path tag and the forwarding information (FT), as recited in claim 1. The Examiner cites to Figure 1 of Kano for disclosing the assigning each traffic stream an identifier called hereinafter a path tag which is sent in said traffic stream on a regular basis. Applicants respectfully disagree. Figure 1 relates to Multi-Protocol Label Switching (MPLS) packet routing systems (i.e., packet networks) (paragraphs 33-35). More particularly, Kano appears to at best disclose forwarding labeled packets from one transmission unit to the next transmission unit (paragraphs 34-35). Figure 1, however, does not relate to a transport network (i.e., SDH, SONET, or OTN). Thus, Kano does not disclose assigning each traffic stream an identifier called hereinafter a path tag which is sent in said traffic stream on a regular basis. Moreover, since Kano fails to disclose assigning each traffic stream an identifier, Kano also fails to disclose checking the path tag (i.e., the identifier) of the received traffic stream and determining an appropriate output port based on said path tag and the forwarding information. That is, since Kano fails to disclose identifiers which are transmitted in the data stream, Kano also fails to disclose checking the path tag of the traffic stream and determining an appropriate output port therefrom.

Furthermore, Kano discloses a transmission unit which manages input parameters including incoming time slots and input interface identifiers, in association with output parameters including outgoing time slots and output interface identifiers (paragraph 143). However, it is important to note that the input and output interface identifiers are not transmitted in the data stream, and thus, the route a time slot has to go must be pre-configured in the network element via network management. Conversely, the present invention proposes a self-routing mechanism for circuit switched transport networks, in which a path tag is sent in said traffic stream on a regular basis.

Also, Kano proposes to change within the network element the relation between incoming and outgoing label (paragraph 145). Rather, the present invention proposes to change the labels in the data stream to affect a re-routing of the data stream in the case of a failure. Thus, by checking the path tag of the received traffic stream and determining an appropriate output port based on said path tag and the forwarding information, the present invention uses the path tag to trigger the table lookup and re-routing.

In addition, claim 1 recites "establishing (a4) an internal cross-connection between said input port (I1) and said previously determined output port." However, it appears there is nothing cited by the Examiner regarding establishing an internal cross-connection in the rejection. Therefore, claim 1 should be patentable for at least this reason.

By citing paragraph 33 and referring to SONET and SDH networks in the rejection, it appears the Examiner is attempting to combine two different embodiments recited in Kano. In particular, Kano discloses a failure recovery method for packet networks (FIGS. 1-20) and optical networks (FIG. 21) (paragraph 33). In the rejection the Examiner appears to be taking

separate and distinct features from both embodiments and combining them to meet the features of the claimed invention. Therefore, the rejection should be obviousness under 35 U.S.C. § 103, and not anticipation under 35 U.S.C. § 102. Claim 1 would not have been obvious in view of Kano for the following reasons.

Although Kano appears to disclose a failure recovery method for connection-oriented optical networks, such as SONET and SDH, Kano fails to disclose a connection-oriented optical network with a failure recovery system according to the features of claim 1. For example, the Examiner points to paragraph 33 of Kano, which mentions SONET and SDH to prove the claimed frame structure and multiplex hierarchy. However, it appears the Examiner overlooks that the optical network application relates only to the fifth embodiment of Figure 21, disclosed at paragraphs 138-142 of Kano. In particular, Kano discloses that the fifth embodiment is an implementation in an optical network, where each network element functions as a transmission unit 10, and different optical wavelengths play the roles of labels in the proposed failure recovery process (paragraph 138). That is, instead of using labels, which are implemented in a packet network via Multi-Protocol Label Switching (MPLS) in the first embodiment, Kano discloses using different optical wavelengths in the optical network. Using different optical wavelengths in an optical network is not the equivalent to using labels. Moreover, it appears Kano teaches away from using labels of the packet network of the first embodiment in the optical network of the fifth embodiment. Therefore, the packet switching technique as disclosed in FIGS. 1-20 of Kano, which uses labels to establish paths, cannot be combined with the circuit switching technique as disclosed in FIG. 21, which uses different optical wavelengths to establish paths.

In view of the above, Kano fails to disclose each and every feature of claim 1. Therefore, claim 1 is patentable for at least this reason.

B. Claim 2

Applicants submit that claim 2 is patentable at least by virtue of its dependency upon claim 1. In addition, claim 2 recites "checking the path tag of the received traffic stream and determining an appropriate output port based on said path tag and the forwarding information of said second network element," which Kano fails to disclose for reasons similar to those presented above in conjunction with claim 1.

C. Claims 3 and 4

Applicants submit that claims 3 and 4 are patentable at least by virtue of their dependencies.

D. Claim 5

Claim 5 recites "said path tag is label which is inserted by the preceding network element and which label will be replaced by the actual network element with a new label for the subsequent network element." Kano, however, does not disclose assigning each traffic stream in the transport network an identifier (i.e., a label) which is sent in said traffic stream on a regular basis. Thus, claim 5 is patentable for reasons similar to those presented above in conjunction with claim 1.

E. Claims 6 and 9

Claims 6 and 9 include analogous, though not necessarily coextensive features to claim 1, and therefore, claims 6 and 9 are also patentable for the reasons discussed for claim 1. In addition, claim 6 recites "a monitor (M1) assigned to said input port (I1) for checking the path

tags of all traffic streams received at said input port and for determining whether any of said received path tags does not correspond to expected path tags and if so, for notifying the unexpected path tag to said low-level controller (CT1)." Further, claim 9 recites allowing "said network elements to determine an appropriate output port for a traffic stream with an unexpected path tag received at an input port by using said path tag and said forwarding information and to establish an internal cross-connection between said input port and said previously determined output port." Applicants submit that Kano does not disclose these features for reasons presented above in conjunction with claim 1. In particular, Kano fails to disclose sending a path tag in said traffic stream on a regular basis.

Moreover, the transmission controller 12 of Kano merely performs transmission of packets with MPLS label switching techniques based on the label table T (paragraph 35). However, the transmission controller 12 is not a crossconnect matrix (S) for crossconnecting any of said traffic streams from said input port (I1) to any of a number of output ports (O2) under the control of said low-level controller (CT2). Therefore, claim 6 should be patentable at least for this additional reason.

F. Claim 7

Applicants submit that claim 7 is patentable at least by virtue of its dependency upon claim 6. In addition, claim 7 recites the "low-level controller (SLC) is adapted to determining an appropriate output port for a traffic stream with an unexpected path tag without involving said high-level controller (FLC)." Applicants submit that Kano does not disclose this feature for reasons presented above in conjunction with claim 1.

G. Claim 8

Applicants submit that claim 8 is patentable at least by virtue of its dependency.

H. Claim 10

Applicants submit that claim 10 is patentable at least by virtue of its dependency. In addition, claim 10 recites:

> to determine new restoration paths from remaining spare capacity in said network after receipt of a notification from a network element saying that a restoration path has been established and to provide new forwarding information to said network elements.

As previously stated, Kano discloses a transmission unit which manages input parameters including incoming time slots and input interface identifiers, in association with output parameters including outgoing time slots and output interface identifiers (paragraph 143). However, input and output interface identifiers are not transmitted in the data stream, and thus, the route a time slot has to go must be pre-configured in the network element via network management. That is, the protection paths of Kano are pre-configured, and do not change dynamically as the remaining spare capacity changes. Thus, Kano fails to disclose determining determine new restoration paths from remaining spare capacity in said network after receipt of a notification from a network element saying that a restoration path has been established and to provide new forwarding information to said network elements. Therefore, claim 10 is patentable at least for this additional reason.

II. New claims

By this Amendment, Applicants have added new claims 11-15 to further define the claimed invention. Applicants respectfully submit claims 11-15 recite additional features which are not taught or suggested by the prior art of record.

Support for new claim 11 can be found at for example page 9 of the Applicants' specification.

Support for new claim 12 can be found at for example page 11 of the Applicants' specification.

Support for new claim 13 can be found at for example page 10 of the Applicants' specification.

Support for new claim 14 can be found at for example page 4 of the Applicants' specification.

Support for new claim 15 can be found at for example pages 4 and 7-8 of the Applicants' specification.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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